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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,299	01/20/2004	Takuo Sone	Q79484	7184

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EXAMINER

EGWIM, KELECHI CHIDI

ART UNIT PAPER NUMBER

1713

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/759,299

Applicant(s)

SONE ET AL.

Examiner

Dr. Kelechi C. Egwim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/033,685.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

1. Claim 9 is objected to because of the following informalities: The recitation "wherein R<sup>25</sup> is a hydrocarbon group having a carbon number of 1-20, and n is an integer of not less than 2" need not be in parentheses. The parenthesis should be removed accordingly.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Starting on the second line on page 8, claim 1, from which the balance of the claims depend, recites "l is an integer of 0-3" in reference to formulas (14), (15) and (16). However, since neither of the formulas (14), (15) and (16) contains a variable "l" it is unclear what variable applicant is attempting to define and therefore, what compound applicant is attempting to encompass in the claims. Further, if the recitation "4-1" and "2-1" in the formulas is supposed to be "4-l" and "2-l", with a definition of 0-3 for l, "2-1" in formula (16) would encompass negative numbers, which is nonsensical. Also, it

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appears that part of formula (16) is missing. It is not clear what compounds applicant is attempting to claim.

5. In addition, while claim 9 recites formulas (19) and (20), no defining structure for these formulas is recited in the claim.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-15 and 18-20, claiming both the product and the process for producing the product in this invention, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikematsu et al. (JP 05059103 or JP 05051406) in combination with Tsujimoto et al. (JP 8073515)

In the abstracts, Ikematsu et al. teach methods for producing conjugated diene polymers comprising polymerizing a conjugated diene in the presence of a catalyst system in an inert organic solvent and reacting the resulting polymer with a carboxylic acid compound (l or j). Ikematsu et al. teach the catalyst system to comprise of a) a lanthanum series (atomic number 57-71) rare earth metal compound, b) an organoaluminum compound represented by  $AlR^1R^2R^3$  (Formula 1 in claim 1), and c) a halide compound.

Ikematsu et al. further teach for the presence of the catalyst system in the polymerization to result in conjugated diene polymers produced with narrow molecular weight distributions and high cis-1,4-bond contents.

Ikematsu et al. differ from the claimed invention in that, the catalyst is not disclosed as comprising an aluminoxane. However, it is known in the art to add an aluminoxane to a catalyst system comprising a) a lanthanum series rare earth metal compound, b) an organoaluminum and c) a halide compound for polymerizing conjugated dienes, for the purpose of obtaining **narrow molecular weight distributions** and **higher cis-1,4-bond contents**, such as taught by Tsujimoto et al. (See ¶ 25 in Full translation of Tsujimoto et al.)

In ¶ 6-7, Tsujimoto et al. teach a conjugated diene polymerized in the presence of a catalyst system, said catalyst system comprising a) a lanthanum series (preferably atomic number 57-64) rare earth metal compound, b) an organoaluminum compound represented by  $AlR^1R^2R^3$  (Formula 1 in claim 1), c) a halide compound and an aluminoxane. See ¶ 15-18 in Tsujimoto et al.

In ¶ 23, Tsujimoto et al. further teach the metal compound to be used in an amount of 0.0001-1.0 mmol per 100g of the conjugated diene compound. Tsujimoto et al. also teaches the catalyst to have such a composition ratio that the molar ratio of the metal compound to the halide compound is 1:0.1-1:15, the molar ratio of the metal compound to the aluminoxane is 1:10-1:5000, the molar ratio of the metal compound to the organoaluminum compound is 1:1-1:5000, the molar ratio of the aluminoxane to the organoaluminum compound is 1:0.01-1:100.

In tables 1, 2 and 6, Tsujimoto et al. show the resulting polymer after polymerization with the catalyst to have Mw/Mn ratios of 3.5 or less.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made, to include aluminoxane in the catalyst system of Ikematsu et al., in order to obtain the advantages taught by Tsujimoto et al. motivated by a reasonable expectation of success.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kelechi C. Egwim whose telephone number is (571) 272-1099. The examiner can normally be reached on M-T (7:30-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCE

**KELECHI C. EGWIM PH.D.  
PRIMARY EXAMINER**

